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Measuring Personality Traits in the Classroom

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Abstract

*In this article, a personality model for the description of children's classroom behaviour is the main focus of interest. It is questioned whether the Five-Factor Personality Model can be used as an organizational structure for the description of personality characteristics in the field of educational practice. Two groups of Dutch school children (*N = *1296 and* N = *367), 4–12 years old, were rated by their teachers on scales of the School Behaviour Checklist–Revised (SCHOBL-R[1]). Analysis of the scales produced four meaningful and identical components in both samples: Extraversion, Attitude towards School Work, Agreeableness, and Emotional Stability. The factorial structure of the scales remained stable over age as well as sex. Boys and girls were rated by their teachers as having different attitudes towards school work, and as differing on emotional stability and agreeableness. The items of the school behaviour checklist were then analysed in the context of other personality scales, leading to the conclusion that the four scales of the SCHOBL-R can be interpreted in terms of four of the five personality dimensions of the Five-Factor Model. The strong relationship between the contents of the different scales used in this analysis supports the idea that the Five (Four) Factor Model is a valid model for the description of individual differences in Dutch school children. Copyright © 1999 John Wiley & Sons, Ltd.*

INTRODUCTION

The recent revival in personality trait research, with its strong emphasis on the Big Five personality structure (e.g. Costa and McCrae, 1988, 1994; Goldberg, 1990, 1993;

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John, 1990; Angleitner and Ostendorf, 1994) has also led to a revival of interest in 'task-related personality traits' (e.g. De Raad, 1996), meaning personality traits that are visible in one or more specific fields of psychology.

One such important domain for personality research is educational practice. Over recent years, there has been increased interest in social and emotional problems in the classroom. Much attention has been paid to the anxious child, the ragged child, the very withdrawn child, the aggressive, impulsive, anti-social child, etc. Underlying this interest is the question of the individual differences in personality traits between children that give rise to individual differences in behaviour at school, and in addition, the possibility of describing these traits by means of questionnaires, checklists, and other assessment instruments.

In this article, a personality model for the description of children's classroom behaviour is our focus of interest. It is questioned whether the Five-Factor Personality Model can be used as an organizational structure for the description of personality characteristics in the field of educational practice. How well does the model account for individual differences in school behaviour of Dutch children attending primary school?

In the late 1970s, Zaal (1978, 1980, 1981) constructed a Dutch personality checklist for use by teachers: the School Behaviour Checklist for children (SCHOBL). The school behaviours that teachers can map using this checklist may be globally described as 'the way children usually have contact with their teacher and each other' (e.g. Bleichrodt, Resing and Zaal, 1993), or, more specifically, as individually based child characteristic behaviours, that have to show a certain consistency over time and situation. In the latter description individual personality 'traits' have a central position. These traits for their part refer to concrete and specific behaviours (e.g. Guilford, 1959; Bleichrodt *et al.*, 1993).

The School Behaviour Checklist was based on verbal descriptions and characterizations by teachers of children's behaviour. These verbal descriptions cover the whole range of 'normal' behaviours in the classroom, in so far as they lie within the social–emotional domain. This is in contrast to assessment instruments such as, for example, the Child Behaviour Checklist (CBCL, Achenbach and Edelbrock, 1983), a checklist that is merely oriented on the extremes of behaviour scales and that measures syndromes like conduct disorders and ADHD (hyperactivity). In the SCHOBL there was also the possibility for describing both non-adaptive and problem behaviour, although with the restriction that 'deviant' behaviour had to be defined in terms of the frequencies with which certain behaviours are reported within the 'normal' school population. Such a definition of 'deviant' behaviour is not unusual and certainly has advantages, since a checklist based on 'normal behaviour in the population' is suitable for a larger group of users. The behavioural descriptions, however, do not necessarily cover all kinds of deviant behaviour (e.g. Guilford, 1959; Anthony, 1970).

An initial reason for defining behaviour in the social–emotional domain in terms of normal rather than deviant behaviour was a psychometrical one. Analysing and interpreting data is more difficult if variables have only a small frequency of occurrence. Besides, when teachers have to rate behaviours that seldom occur, this can have a negative influence on their willingness to rate the behaviour of all pupils in the classroom. In addition, the mere fact of frequently rating seldom occurring behaviour can easily lead to a 'halo effect': the child will only be judged on one general good–bad dimension.

Another reason for defining behaviour in terms of 'normal within the school population' came from the literature. A number of early studies suggested that structures for behavioural judgements show, for different groups and under a variety of circumstances, mostly a similar pattern (e.g. Cattell and Coan, 1957; Digman, 1963; Norman, 1963; Zaal, 1978). From more recent studies in the field of personality description (e.g. Digman, 1989, 1990; Goldberg, 1990, 1993; Halverson, Kohnstamm and Martin, 1994; Hofstee and De Raad, 1991) it appears that the structures of personality descriptions, as studied empirically using factor or cluster analysis, have a strong overlap with factors reported in these older studies. More and more, researchers in this field speak of five large personality dimensions, called the Big Five or the Five-Factor Model (e.g. Norman, 1963).

This five-factor structure can be found in personality descriptional research on both adults (Elshout and Akkerman, 1975; Hofstee and De Raad, 1991; McCrae and Costa, 1985) and children (Digman, 1963, 1994; Digman and Inouye, 1986; Digman and Shmelyov, 1996; Halverson *et al*., 1994; John, Caspi, Robins, Moffitt and Stouthamer-Loeber, 1994; Kohnstamm, 1992; Kohnstamm, Halverson, Havill and Mervielde, 1996; Van Lieshout and Haselager, 1994; Mervielde, 1994). The five factors, which several authors discriminated in both the free descriptions by parents of their children (e.g. Kohnstamm *et al*., 1996; Kohnstamm, Mervielde, Besevegis and Halverson, 1995) and the descriptions by teachers of the behaviours of their pupils in the classroom (e.g. Digman, 1963, 1989; Digman and Inouye, 1986; Digman and Shmelyov, 1996; Mervielde, 1994) might be described as: (I) Extravert–Introvert; (II) Agreeable–Disagreeable; (III) Conscientious–Non-Conscientious; (IV) Emotionally Stable–Emotionally Instable; and (V) Open–Non-Open to Experience. These factors appear comparable to the description by Hofstee and De Raad (1991) of the basic dimensions of the Five-Factor Model in terms of: (I) Extraversion/Surgency/Spontaneity/Activity; (II) Agreeableness/Goodness/Friendliness/Altruism/Respect; (III) Conscientiousness; (IV) Emotional Stability versus Emotional Instability/Emotionality/Neuroticism; (V) Intellect/Openness to Experience/Culture/Creativity/Autonomy. However, the controversy about the interpretation of this last factor, in terms of Intellect or Openness, still continues (De Raad, 1994; Goldberg, 1994; Hofstee, 1994; McCrae, 1994; and others (see the special issue of 1994, *European Journal of Personality*, **8**). In Goldberg's studies, the factor V interpretation of Intellect predominates, but Costa and McCrae prefer a factor V in terms of Openness to Experiences, a dimension that is only weakly related to intelligence measures.

In this article, we first examine whether the underlying structure of the school behaviour checklist fits the Five-Factor Personality Model. According to Kohnstamm (1992), for such a five-factor structure to emerge, at least two conditions must be fulfilled: (1) the range of behavioural descriptions must be as wide as possible; and (2) the research samples have to be large enough. Both conditions will be fulfilled in this study. We describe the underlying personality structure using factor analyses on two independent data sets. In addition, we examine whether this structure is age and sex independent. Gender differences in teacher ratings for boys and girls is also addressed. Finally, we discuss the usefulness of the Five-Factor Model as an organizational structure for the description of personality characteristics of Dutch school children (nursery and primary education, grade 1 to 6) as viewed by their teachers, comparing the results of our study with the results of Digman (1994), Digman and Inoyue (1986), and Digman and Shmelyov (1996)—important studies confirming the Five-Factor

Model in personality ratings of children—and with anchor-adjectives within the Big Five research, as proposed by Goldberg (1990).

METHOD

Participants

To fulfil Kohnstamm's second condition for finding a five-factor personality structure in children, the research samples have to be large. Two independent, comparable samples (one of them very large) were used in two studies that took place with an interval of three years.

Study 1

Sample I ($N = 1296$) consisted of children who were part of the norm group in a study concerning the Revision of the Amsterdam Child Intelligence Test (Amsterdamse Kinder Intelligentie Test (Bleichrodt, Drenth, Zaal and Resing, 1987)). The children were recruited from 104 different schools for primary education[2] and varied in age from 4 years 2 months to 11 years 2 months. For optimal representativeness of the sample, stratification criteria were region, urbanization level, school size, age, and sex. Per school and per age group, two boys and two girls (4 and 5 years old) or one boy and one girl (6–12 years old) were randomly chosen. Teachers rated the children in sample I on one of the two parallel forms of the SCHOBL-R (form B).

Study 2

A second study was performed to make cross-validation possible. Sample II consisted of 367 children, recruited from 46 primary schools. These schools were randomly chosen from the 104 different schools that had participated in the first study three years earlier. Per school, eight children were randomly selected over the four age groups: 4, 6, 8, and 10 years old. Per age group one boy and one girl were selected. Teachers rated the children in sample II on both parallel forms of the SCHOBL-R (form A and form B), with a pause of 14 days between the two ratings. Only data collected with form B will be presented in this study.

Measures

Models of Stott (1962, 1967), Cattell (1957), and Becker and Krug (1964) were used in the construction phase of the original checklist SCHOBL (Zaal, 1978). These authors used a large number of bipolar adjectives for rating the personality characteristics of children. From these models and other literature on child personality, about 200 bipolar adjectives were selected. These adjectives were given to teachers. In a structured interview procedure the teachers were asked to 'translate' these adjectives into overt, behavioural descriptions in terms of concrete, visible behaviour in the classroom. They were asked to construct one or more concrete behavioural

[2]In the Netherlands, children from 4 to 13 years attend primary school (*basisschool*). Nursery education is part of primary education.

description(s) for each adjective. The teachers produced, in total, more than 460 different concrete behavioural descriptions, which were subsequently converted into 228 bipolar behavioural scales, each scale consisting of two opposite, concrete behavioural utterances. So, Kohnstamm's (1992) first condition for a five-factor structure to emerge, a wide range of behavioural descriptions, seems to be fulfilled too.

Using cluster and principal component analyses, 104 different bipolar behavioural utterances were finally selected. With these 104 items, two parallel checklists (form A and form B) for measuring school behaviour (SCHOBL) were composed (e.g. Zaal, 1978, 1981). These two forms were revised by the authors to form the final SCHOBL-R (Bleichrodt *et al.*, 1993; Resing and Bleichrodt, 1997) that is suitable for use with children in the age range from 4 to 12 years.

Procedure

In both samples the social–emotional functioning of children in the classroom was measured using the newly revised SCHOBL-R consisting of 52 items concerning children's concrete, visible, school behaviour. Each item consists of two bipolar behavioural descriptions which are each other's opposites. Teachers were supplied with rating sheets for the children selected from their class. The sheets contained the 52 bipolar behaviour characteristics to be rated (see Table 3 for detailed information). Teachers were asked to read both behavioural characteristics carefully, and to refer to the description when in doubt as to the meaning of one of them. Between item poles there was a six-point rating scale printed, for example:

Talks a lot 3 2 1 – 1 2 3 *Hardly says a word*

With this rating scale format, the teacher has to make two decisions: (1) which of the two opposite descriptions characterizes the child better, and (2) for the chosen description, the degree to which the characteristic is present in the pupil—fully (3); to a reasonable extent (2); or just better than the opposite behaviour (1). Thus, the teacher has to make two rating choices. First, he has to choose which behavioural description fits best for the particular child (forced choice). Second, he has to nuance this choice: the chosen description fits fully, reasonably, or only a little. Teachers were warned not to rate in between the two utterances (on the—point). They were also warned to be cautious in using the extremes of the scale. They were told that most children would be expected to fall in the categories (1) and (2). They were asked to rate the behavioural characteristics that were generally visible in the child. 'Don't think too long about your answer, your first impression is often the best', was added to the instruction. Before the rating procedure started, teachers had to fill in three practise ratings, which had written explanation about the choices (1), (2), and (3) for both sides of the item. The ratings were collected during one school year.

Analyses

Factor analyses were carried out on two independent data sets (sample I and sample II). Items in personality questionnaires seldom appear to fit a perfectly simple structure. Many important traits fall between the orthogonal axes (e.g. De Raad, Hendriks and Hofstee, 1992). McCrae, Zonderman, Costa, Bond and Paunonen

(1996) conclude that there are no theoretical reasons why traits should not have meaningful loadings on more than one factor. They also conclude that in much research on the Five-Factor Model confirmatory factor analysis does not give (any) support for such a model, even if the least restrictive model is chosen. The main problem lies in the large number of difficult to interpret and very specific factors such a model generates (with this particular type of data) in order to reach reasonable fit indices. It therefore was decided to use no confirmatory factor analytic techniques (e.g. Bookstein, 1986; McCrae *et al*., 1996; Goldberg and Digman, 1994) because the theory underlying the Five-Factor Model and other personality theories does not allow us to specify in advance where secondary loadings must be incorporated in the confirmatory model. We chose to use explanatory principal axis factoring (PAF) to describe the factorial structure of the data set, followed by a replication study on a second, independent sample.

RESULTS

For the SCHOBL (Zaal, 1978), originally four main clusters of behaviour were reported: Frankness, Attitude towards School Work, Agreeableness, and Emotionality. At the time of construction, the explicit restriction (e.g. Zaal, 1978) was made that the checklist should measure behaviour that lies strictly within the social–emotional domain. This point of view led to the exclusion of descriptions of intellectual behaviour. Descriptions or statements about, for instance, the intelligence or the cleverness of a child in the classroom were not included in the original item pool. A strict distinction was made between the intellectual and other personality domains. Therefore, it was expected to find four instead of the five factors of the Five-Factor Model in our analyses.

To examine the factorial structure of the SCHOBL-R, principal axis factoring with orthogonal (varimax) rotation was carried out on two independent data sets (sample I and sample II). In addition, principal axis factoring with oblique (oblimin, delta is 0) rotation was performed.

Based on a combination of the outcomes of the scree test (the distribution of the eigenvalues are to be found in Table 1), the coefficients of congruency calculated

Table 1. First 20 eigenvalues of the correlation matrices for sample I ($N = 1296$) and sample II ($N = 367$)

Factor	Sample I eigenvalue	Sample II eigenvalue	Factor	Sample I eigenvalue	Sample II eigenvalue
1	12.67	12.35	11	0.83	0.97
2	7.21	7.01	12	0.76	0.88
3	3.51	3.89	13	0.75	0.84
4	2.50	2.50	14	0.71	0.79
5	1.50	1.39	15	0.70	0.77
6	1.19	1.38	16	0.66	0.72
7	1.07	1.28	17	0.64	0.70
8	1.00	1.20	18	0.64	0.68
9	0.97	1.13	19	0.62	0.66
10	0.85	1.03	20	0.61	0.65

Table 2. Congruency coefficients (Everett's method)

No. of factors						
2	0.9984	0.9975				
3	0.9980	0.9966	0.9980			
4	0.9938	0.9912	0.9888	0.9883		
5	0.9842	0.9947	0.9757	0.9690	0.9401	
6	0.9861	0.9907	0.9825	0.9560	0.9512	0.9021

according to Everett's (1983) method with subsamples based on a random split of sample I subjects (see Table 2) and on our own theoretical considerations (earlier research with the SCHOBL showed four factors, with explicit exclusion of items from the intellectual domain), four factors were extracted and rotated by varimax and oblimin respectively.

The orthogonally rotated PAF solution for sample I is shown in Table 3 (only factor loadings >0.20 are shown; loadings equal to or higher than 0.40 are printed bold). This solution shows a clearly interpretable factorial structure, with 42 items that have high loadings on only one of the four main factors and low loadings on the others and five items that have high or considerable loadings on two of the four factors.

Although, from a theoretical perspective, we expected to find a four-factor-solution, in addition a search for a fifth factor was performed. In order to answer the question whether our data possibly give rise to a fifth factor (with an 'Openness to Experience' content), principal axis factoring with varimax rotation to five factors was carried out. A very small and not easily interpretable fifth factor was found, with only three items with loadings higher than 0.40 (items 10 and 38 with positive loadings, and item 34 with a negative one) and with no clear common content.

Exploratory principal axis factoring (both orthogonal and oblique rotation) was also performed on the data from sample II. The eigenvalues for this sample are shown in Table I. Extracting four factors and rotation by varimax for both analyses yielded a clear factorial structure. The main factor loadings of the items for the orthogonal rotated factor solutions for both samples are shown in Table 4.

Again, rotation to five factors was performed. The small fifth factor found in data set I was not replicable using data set II; the phi-coefficient was 0.84. These analyses give further support to our theoretical assumptions about the underlying four-factor personality structure.

Table 4 also shows the factor loadings of the items for the oblique rotated factor solutions for both sample I and sample II (see the italically printed third and fourth columns below each factor reported in this table). Orthogonal and oblique rotation give nearly the same results. All important loadings stay on the same positions in both factor solutions. In both cases the same four, clear to interpret factors become visible.

After varimax rotation to four factors, the similarity of the two rotated solution patterns was examined. Large similarity measures imply replicability and support the validity of the factorial structure. The computed Tucker phi-coefficients, as measures of factorial invariance, were: Extraversion 0.99, Attitude towards School Work 0.99, Agreeableness 0.96, and Emotional Stability 0.96. To determine the similarity of the two factor solutions, a lower limit phi-coefficient of 0.85 was set as a criterion (e.g. Cattell, 1978; Ten Berge, 1977). It is clear that the similarity between the two

Table 3. Rotated (by varimax) four-factor solution for SCHOBL-R (only one (shortened) side of each scale is shown) (sample I, $N = 1296$)

Items SCHOBL-R form B		I	II	III	IV
B5	Always keeps thoughts and feelings to himself	**−0.66**			0.28
B7	Talks a lot to class-mates	**0.72**			
B15	Finds it wonderful to say something in front of the class	**0.68**			
B19	Dares not say anything to a 'stranger'	**−0.70**			
B25	Is very tense when he gets a turn	**−0.53**			−0.29
B27	Wants to see everything that is going on	**0.66**			
B30	Never comes on his own accord when the teacher looks for somebody to do something	**−0.57**			0.32
B33	Never makes unexpected remarks	**−0.69**			
B34	Is often chosen as a leader	**0.57**	−0.24		
B40	Always talks before his turn	**0.67**	0.32	0.30	−0.20
B43	Always begins something that goes far beyond his strength	**0.52**			
B50	Never shows any initiative	**−0.67**	0.20		
B20	Has no opinion of his own	**−0.56**		−0.39	
B31	Continually interferes with work of others	0.37	0.33	0.29	
B4	Always turns out the same achievements		**0.66**		
B8	You can count on his promises		**0.66**	0.27	
B13	Always tries to do more than necessary		**0.67**	0.23	
B16	Works fast, then again slow		**−0.55**		
B22	Can only concentrate on a task for a short time		**−0.83**		
B28	Always knows exactly where they are in the lesson	−0.22	**0.77**		
B32	Always chooses jobs from which you can see if you have done them well or not		**0.53**		
B36	Is soon not interested any longer in certain things		**−0.70**		
B39	Never thinks before he does something		**−0.68**		
B42	Follows instructions literally, whatever happens		**0.59**	0.23	
B46	Tells a story that has happened before just like he told		**0.52**		
B51	When colouring, always stays within the lines		**0.54**		
B14	Has to be warned continuously for the same things	−0.28	**−0.58**	**−0.47**	
B2	Uses abusive language against class-mates	−0.23	−0.36	**−0.57**	
B9	Gets angry when someone hampers him accidentally	−0.22	−0.20	**−0.69**	0.25
B12	Always hangs his cloak to the wind		−0.24	**−0.48**	
B18	Gets angry on the least provocation	−0.21	−0.20	**−0.66**	0.37
B21	Continuously utters his discontent		−0.32	**−0.58**	
B26	It is difficult for him to say that he is wrong		−0.25	**−0.62**	
B35	Seldom takes own interest into account	0.23	0.21	**0.61**	
B41	Cannot bear success of others	−0.27		**−0.54**	
B44	Makes jokes about mistakes of others		−0.29	**−0.54**	
B48	Would not hurt a fly	0.26	0.34	**0.66**	
B10	Hardly anyone wants to sit next to him	0.25	−0.33	−0.38	
B24	Does not care much for other children	0.23	−0.30	**−0.43**	−0.35

Table continued over page

Table 3. Continued

Items SCHOBL-R form B		I	II	III	IV
B38	Class-mates resist when he wants them to do something	0.25	−0.30	−0.36	
B45	Is not at once enthusiastic when teacher asks something	−0.37	**−0.40**	**−0.43**	0.21
B49	Always wants to dominate	**−0.56**		**−0.55**	
B52	Lets himself be imitated	**0.46**		**0.54**	
B1	Goes to the teacher at once, if he feels wronged			0.23	0.38
B6	Shows great emotion, more than others	−0.33		−0.24	**0.58**
B11	Asks teacher for help if he thinks he cannot do a certain thing				**0.38**
B17	Is easily flustered	0.22			**0.57**
B23	Reacts more emotionally than other children		−0.25	−0.28	**0.57**
B29	Is very upset when he has done something forbidden		**0.42**	0.31	**0.51**
B37	If a child has a bad fall, he is more upset than the others			0.32	**0.47**
B47	When he has done something well, he looks at the teacher at once to see if he has seen it				**0.42**
B3	Often talks about how well he can do things	0.31		0.24	

orthogonally rotated factor solutions, based on the data of two independent samples is high.

From the plot of eigenvalues (see Table 1), it can be concluded that the obtained factorial solutions explain about 50 per cent of the variance in both samples.

The presented factors can be labelled as follows, based on a content analysis of the items and the terminology of the Five-Factor Model:

(i) *Extraversion*. This factor describes the introvert–extravert dimension. The extravert child shows that he is there, talks a lot, is very active, shows initiative, is cheerful and open, is self-confident, and dominates other children. At this pole we see the frank, active, and energetic child and at the opposite pole the inhibited, shy, and withdrawn child.

(ii) *Attitude towards School Work*. Indicative of this factor are behaviours concerning learning and application at school: the child with a positive attitude towards school work is able to concentrate on his work for a longer time, has a constant level and tempo of performance, is dedicated to his school work, and is orderly and conscientious. The child with a negative attitude towards school work is easily distracted, is not interested in school work, is careless, has a variable level of performance, and has to be warned often in the classroom. This factor is comparable with the Conscientiousness factor of the Five-Factor Model, but its content is restricted to school behaviour.

(iii) *Agreeableness*. This factor consists of behaviour descriptions concerning interactions with others. There is a good–bad polarity. Teasing and selfish behaviours have opposites such as good-heartedness and generosity. Irritable and easily angry contrast with calm and compliable, critical and egocentric with assenting and altruistic.

Table 4. Main factorial loadings (varimax/oblimin; four factor solutions) of the items from sample I and sample II between [ ]; oblimin loadings (printed *italic*); see for the content of items Table 3

Factor 1		Factor II		Factor III		Factor IV	
Item	Loadings (orthogonal/ *oblique*)	Item	Loadings (orthogonal/ *oblique*)	Item	Loadings (orthogonal/ *oblique*)	Item	Loadings (orthogonal/ *oblique*)
B5	0.66 (0.64)	B4	0.66 (0.65)	B2	0.57 (0.56)	B1	0.38 (0.37)
	0.65 (0.65)		*0.68 (0.66)*		*0.55 (0.54)*		*0.39 (0.40)*
B7	0.72 (0.69)	B8	0.66 (0.67)	B9	0.69 (0.47)	B6	0.59 (0.59)
	0.69 (0.66)		*0.64 (0.67)*		*0.74 (0.52)*		*0.56 (0.57)*
B15	0.68 (0.68)	B13	0.67 (0.67)	B12	0.48 (0.27)	B11	0.38 (0.45)
	0.69 (0.68)		*0.65 (0.68)*		*0.54 (0.29)*		*0.37 (0.44)*
B19	0.70 (0.75)	B16	0.55 (0.60)	B18	0.66 (0.32)	B17	0.57 (0.70)
	0.71 (0.76)		*0.56 (0.60)*		*0.72 (0.35)*		*0.57 (0.71)*
B25	0.53 (0.45)	B22	0.83 (0.82)	B12	0.58 (0.49)	B23	0.57 (0.66)
	0.56 (0.47)		*0.87 (0.86)*		*0.59 (0.52)*		*0.55 (0.64)*
B27	0.66 (0.58)	B28	0.77 (0.78)	B26	0.62 (0.66)	B29	0.51 (0.48)
	0.61 (0.53)		*0.80 (0.80)*		*0.64 (0.69)*		*0.54 (0.53)*
B30	0.57 (0.59)	B32	0.53 (0.53)	B35	0.61 (0.65)	B37	0.47 (0.36)
	0.54 (0.52)		*0.50 (0.53)*		*0.63 (0.66)*		*0.48 (0.37)*
B33	0.69 (0.63)	B36	0.70 (0.75)	B41	0.54 (0.56)	B47	0.42 (0.38)
	0.68 (0.62)		*0.70 (0.75)*		*0.58 (0.59)*		*0.41 (0.37)*
B34	0.57 (0.68)	B39	0.68 (0.63)	B44	0.54 (0.60)		
	0.56 (0.68)		*0.69 (0.64)*		*0.53 (0.60)*		
B40	0.67 (0.66)	B42	0.59 (0.61)	B48	0.66 (0.67)		
	0.62 (0.61)		*0.59 (0.59)*		*0.65 (0.67)*		
B43	0.52 (0.49)	B36	0.52 (0.46)	B10	0.38 (0.35)		
	0.50 (0.48)		*0.51 (0.40)*		*0.38 (0.33)*		
B50	0.67 (0.64)	B51	0.54 (0.48)	B24	0.43 (0.52)		
	0.63 (0.59)		*0.57 (0.49)*		*0.40 (0.49)*		
B20	0.56 (0.56)	B14	0.58 (0.63)	B38	0.36 (0.38)		
	0.56 (0.49)		*0.50 (0.58)*		*0.36 (0.38)*		
B31	0.37 (0.38)			B45	0.40 (0.36)		
	0.37 (0.40)				*0.38 (0.31)*		
B49	0.56 (0.58)			B49	0.55 (0.47)		
	0.43 (0.48)				*0.57 (0.50)*		
B52	0.46 (0.49)			B52	0.54 (0.51)		
	0.35 (0.39)				*0.53 (0.50)*		

(iv) *Emotional Stability*. This factor describes emotional aspects of behaviour. Descriptions such as 'cries easily', '(over)-concerned about everything', 'makes a problem of everything', and 'easily upset' have high loadings on this factor. Opposite types are, for example, the sentimental and sensitive child who quickly enlists the teacher's support on the one hand and the insensitive, sometimes indifferent child that will fight his own battles.

Oblique rotation gives the same, clear to interpret four-factor structure.

Next it was examined whether the factorial structure was stable over the different age groups. Content consistency of the SCHOBL-R was examined by comparing the results of principal axis factoring for the various age subgroups. Exploratory PAFs were performed for the age groups 4.2–6.2 years, 6.2–8.2 years, and 8.2–11.2 years

Table 5. Tucker phi-coefficients for measuring factorial invariance of the factor matrices of SCHOBL-R Form B for all three age groups 4.2–6.2 ($N = 350$), 6.2–8.2 ($N = 379$), 8.2–11.2 ($N = 567$) and boys ($N = 635$) and girls ($N = 661$)

Components	Age 4.2–6.2/6.2–8.2	Age 4.2–6.2/8.2–11.2	Age 6.2–8.2/8.2–11.2	Girls/boys
Extraversion	0.97	0.97	0.98	0.99
Attitude to School Work	0.97	0.97	0.98	0.98
Agreeableness	0.96	0.93	0.98	0.98
Emotional Stability	0.96	0.92	0.96	0.97

Table 6. Intercorrelations between orthogonal factor scales of SCHOBL-R for three age groups: 4.2–6.2 years ($N = 350$), 6.2–8.2 years ($N = 379$), 8.2–11.2 years ($N = 567$); intercorrelations between oblique factor scales for sample I and sample II (lower part of table)

Factor scales	Extraversion			Att. towards School			Agreeableness		
	4.2–6.2	6.2–8.2	8.2–11.2	4.2–6.2	6.2–8.2	8.2–11.2	4.2–6.2	6.2–8.2	8.2–11.2
Att. School	−0.02	−0.02	−0.12						
Agreeabl.	−0.51	−0.32	−0.41	0.33	0.48	0.53			
Em. Stab.	−0.06	−0.14	−0.19	0.19	0.14	0.07	0.09	0.11	0.11

Factor scales	Extraversion Sample I/II	Att. towards School Sample I/II	Agreeableness Sample I/II
Att. School	−0.07/0.01		
Agreeabl.	0.26/0.24	0.42/0.42	
Em. Stab.	−0.07/−0.14	−0.08/−0.06	0.02/0.02

(sample I). In addition, the data for boys and girls were analysed (by principal axis factoring) separately. As a measure of factorial invariance, Tucker phi-coefficients were again computed. Table 5 shows these Tucker phi-coefficients, per factor and age group. The similarity in factorial structure of the three age groups is seen to be high (0.92–0.99). The factorial structure for boys and girls appears to be almost identical (phi-coefficients between 0.97 and 0.99).

The internal consistencies (homogeneity coefficients α) of the factor scales, for both sample I ($N = 1296$) and sample II ($N = 367$) are high; for Extraversion respectively 0.90 and 0.90, for Attitude towards School Work 0.90 and 0.90, for Agreeableness 0.89 and 0.86, and for Emotional Stability 0.69 and 0.74. For boys and girls as well as over the various age groups the internal consistencies are mostly identical. The SCHOBL-R scales have homogeneity coefficients that are very acceptable (above 0.85) except for the factor Emotional Stability, but this factor has a limited number of items.

Table 6 shows, for sample I, the intercorrelations between the factor scales (orthogonal rotation), for the three different age groups (4.2–6.2 years ($N = 350$), 6.2–8.2 years ($N = 379$), and 8.2–11.2 years ($N = 567$)). In the second part of this table the factor correlation matrices of the oblique rotated factor solutions (for sample I and II) are presented.

Emotional Stability appears to be the most independent scale. The highest intercorrelations are found between Agreeableness on the one hand and both Extraversion and Attitude towards School Work on the other hand. The negative correlations between Extraversion and Agreeableness can be explained by the fact that teachers

Table 7. Mean scores (M) and standard deviations (sd) for three age groups and boys and girls separately on the four factor scales of the SCHOBL-R, sample I

	4.2–6.2 years				6.2–8.2 years				8.2–11.2 years			
	Boys $N = 171$		Girls $N = 179$		Boys $N = 185$		Girls $N = 194$		Boys $N = 279$		Girls $N = 228$	
Component scales	*M*	sd	*M*	sd	*M*	sd	*M*	sd	*M*	sd	*M*	sd
Extraversion	42.7	10.5	44.7	12.1	45.2	10.5	44.2	10.1	44.9	9.8	43.5	9.7
Attitude to School Work	44.9	11.3	47.9	10.9	43.4	10.2	49.8	10.7	44.7	10.6	49.0	11.0
Agreeableness	36.0	8.0	37.3	7.4	35.1	7.8	38.3	7.3	34.1	8.0	37.9	7.8
Emotional stability	24.9	5.6	24.5	5.1	25.2	5.1	25.2	4.9	27.3	4.9	26.5	5.3

often rate highly active and bossy children also as rough and self-centred. The positive relationship between Attitude towards School Work and Agreeableness is the result of an overlap in rated behaviours such as disobedient and impulsive on the one hand and rough and self-centred on the other hand. Table 6 shows only minor differences in correlational patterns between the three age groups. The relationship between Extraversion and Agreeableness is somewhat less strong for older children (difference test: chi-square = 9.65; $p = 0.008$) whereas the relationship between Agreeableness and Attitude towards school work, in contrast, becomes somewhat stronger with age (chi-square = 13.34; $p = 0.001$).

In general, it can be concluded that the intercorrelations are not very high, and that both orthogonal and oblique rotated factors give comparable correlation patterns between factor scores. Furthermore, the reliability of the four different scales is high, so that enough unique variance remains per factor scale.

To investigate possible gender differences in the way teachers rate the school behaviour of their pupils, data from the SCHOBL-R were analysed for three age groups (4.2–6.2, 6.2–8.2, and 8.2–11.2 years) for children in sample I. Mean raw scores were computed, for boys and girls separately and these scores are presented in Table 7. In addition, a multivariate analysis of variance with gender and age as factors was performed.

Significant gender effects were found for the mean scores on the factors Agreeableness ($F(1;1055) = 39.02$; $p < 0.001$), Attitude towards School Work ($F(1;1055) = 55.19$; $p < 0.001$), and Emotional Stability ($F(1;1055) = 6.53$; $p = 0.01$). It appears that, according to the ratings by their teachers, girls have a more positive attitude towards school work and are more agreeable, but are emotional less stable. No significant age effects were found and no significant interactions between gender and age were found. Using the data from sample II, a comparative multivariate analysis of variance was performed. The results of both analyses are nearly identical: no significant age effects and significant gender effects for three of the four scales were found.

DISCUSSION

The SCHOBL-R has a clear underlying factorial structure that remains stable over age. On the factors Extraversion, Attitude towards School Work, and Agreeableness,

almost all factorial loadings are higher than 0.50, with most being higher than 0.60. For the fourth factor, Emotional Stability, most factorial loadings are somewhat lower. Orthogonal and oblique rotation show very comparable results. These findings support the conclusion of, among others, Digman and Shmelyov (1996) who reported that the Five-factor model has proved to be a very robust model across age. In our research, we did not find the fifth factor (Openness to Experience/Intellect), but this was in accordance with our expectations. In the construction of the SCHOBL questionnaire the explicit restriction (e.g. Zaal, 1978) was made that the list should measure behaviour that lies strictly within the social–emotional domain. This point of view led to the exclusion of all behavioural descriptions concerning the intelligence, the creativity, or the cleverness of the child. Therefore, it was expected at the onset to find only four of the five factors of the Five-factor model in our analyses. Nevertheless, in addition a search for a fifth component was performed. We could not find a good interpretable fifth component, and this component was not replicable using data set II. Only a few items loaded on this component, with contents like 'nobody wants to sit next to him', certainly no items with an 'Openness to Experience' or 'Intellect' content. Zuckerman (1991) also reported research in which he did not find a factor Culture because he did not include 'Intellect' or 'Culture' markers. Given the debate on the meaning of factor V and Zuckerman's (1991) model without the factor Culture, our finding of only four robust factors in both item pools (SCHOBL-R A and B) in which the intellect domain is not represented, seems to support the view that Factor V is indeed intellect.

The four main factors we found in our analyses have comprehensible and interpretable contents and fit well within existing findings on personality traits in children. They are clearly recognizable as the Big Four found in other countries and languages. We therefore compared the content of our four SCHOBL-R factors with the factors reported by Digman and Shmelyov (1996). These authors compared the data of 480 Russian school children, rated by their teachers on 60 personality scales, with those of similar studies based on Hawaiian children (Digman and Inouye, 1986). The 60 scales, as described in appendix A of Digman and Shmelyov's article, were drawn from three sources: the temperament literature, studies of child personality, and Russian educators. Part of the scales had been used earlier by Digman and Inouye (1986). In addition, we compared the content of the reported components of the SCHOBL-R with the 35 child personality rating scales described by Digman (1994, p. 328) and with Goldberg's (1990, pp. 1224–1225) 100 synonym clusters as found in adult personality research.

Although not all the SCHOBL-R scales could be exactly translated into the Goldberg synonyms, the overlap in content of the four components can be said to be striking. The same is true for the comparison of the scales of the four SCHOBL-R factors with the scales of Digman and Shmelyov (1996) and those described by Digman (1994), except for the factor Attitude towards School Work. Our factor can be described in terms of the factor Conscientiousness, but only as far as school behaviour is concerned. This is the reason why we did not label this factor Conscientiousness. In our study this factor is indicated by terms such as persevering, focused, attentive, predictable, reliable, trustworthy, stable in interests, thoughtful, consistent, orderly, exacting, and precise as opposed to unpredictable, careless, irresponsible, fickle, absent-minded, inconsistent, lazy, sloppy, and disorganized and that is only part of the content of Conscientiousness factors as described by others.

It can be concluded that the Five-Factor Model, or at least four of the five factors, which were originally found in samples of American adults (e.g. Goldberg, 1990), and which appeared to be a valid model for the description of individual differences in Russian as well as Hawaiian children (Digman and Shmelyov, 1996) also appears to be a valid model for describing individual differences in Dutch primary school children as rated by their teachers. The model has also proved to be very robust across age: the very same factors were reported for children ranging in age from 4 to 12 years. The components also appear to be stable over historical era. When the mean raw scores of young children on the four components of the original SCHOBL (Zaal, 1978) are compared with the mean raw scores of young children on the four components of the SCHOBL-R, more than 15 years later, no large changes appear to have occurred. Children are judged by their teachers now in the same way as in the earlier study.

The same factorial pattern was reported for boys and girls. However, boys and girls are not rated as having the same attitude towards school work, and differ in emotionality and agreeableness. According to their teachers girls are more agreeable, more emotional and have a better attitude to school work than boys. The reported differences in teacher ratings of boys and girls remain stable over age. On the basis of these results, a possible conclusion could be that teachers, when they have to rate the social–emotional behaviours of their pupils, use the 'average' child in their classroom as a point of reference. The differences in average SCHOBL-R scores between boys and girls seem to be part of (judged) differences within the classroom. With results based on teacher reports it is not possible to say what causes these reported differences: do boys show different behaviour than girls, or do teachers, through gender stereotyping, judge the same behaviours of girls and boys differently? Havill, Allen, Halverson and Kohnstamm (1994) in a study of free personality descriptions of children by their parents reported that girls were described as being more sociable and emotional than boys.

The reported differences in judged behaviour in girls and boys inevitably raises the question of whether these differences really exist or whether teachers unconsciously base their decision on common gender stereotypes. This dilemma cannot be solved by using personality questionnaires which make use of behavioural ratings instead of objective registration of real life behaviour. It is therefore necessary to interpret gender differences with appropriate restraint. On the basis of these results and considerations we decided to make separate norms for boys and girls.

In contrast, however, there is evidence that teacher ratings, as measured by the SCHOBL-R, have adequate reliability, objectivity, and validity. Zaal (1978) reported good interjudgement reliabilities between ratings of the same children by different teachers. He also reported stable re-judgement reliabilities. Further, we found differences between teacher ratings in primary and special education in The Netherlands. Children in special education frequently have combined social–emotional and intellectual problems or low school performance. It might be expected that teachers rate these children as deviant from the 'average' child in primary education. Bleichrodt *et al.* (1993) and Resing and Bleichrodt (manuscript in preparation) indeed found such differences in teacher ratings of behaviour of children in their classroom, indicating that teachers do not only use their own classroom as a point of reference for their judgements. Further research on the relationship between rated behaviour (by teachers as well as by parents) and objective measures based on behavioural criteria is advisable, however. This could possibly be achieved by a combination of

behavioural questionnaires like the SCHOBL-R and video-registration of behaviour in the classroom.

Such a combination of different methods in measuring the behaviour of children can also give more insight into the question of whether the Five (Four) Factor Model is a universal model for describing actually existing personality differences in individuals, or whether it is only a model existing in the head of its users, i.e. the teachers and other persons who have to rate the behaviour of (their) children (e.g. Digman, 1989). Do people have only five dimensions in their head in terms of which they are able to describe children, or do these five behavioural domains really exist as objective and registrable behaviour? In both cases however, the Five-Factor Model—or at least the model based on the four factors reported in this study—is a very useful model to describe individual differences in normal and deviant school behaviour of children.

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